DOCUMENT RESUME

ED 281 435 HE 020 339

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TITLE The Historical Development of the Teacher-Researcher Ideal in Germany and the U.S.A. ASHE 1987 Annual Meeting Paper.
PUB DATE Feb 87
NOTE 55p.; Paper presented at the Annual Meeting of the Association for the Study of Higher Education (San Diego, CA, February 13-17, 1987).
PUB TYPE Historical Materials (060) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC03 Plus Postage.
DESCRIPTORS Chemistry; Comparative Education; *Educational History; *Educational Philosophy; Higher Education; Institutional Mission; *Intellectual History; Natural Sciences; *Researchers; Romanticism; Scholarship; *Teacher Role
IDENTIFIERS *ASHE Annual Meeting; *Germany; Nineteenth Century; United States; von Humboldt (Wilhelm)

ABSTRACT

The way that the teacher/researcher ideal developed in Germany is discussed, along with discrepancies between the original context of the concept and the American one. The focal point is the foundation of the University of Berlin in 1810. Social, political, and intellectual development of the eighteenth century are reviewed, along with reforms at the University of Halle and Gottingen University, the German intellectual movements of German Romanticism and German Idealism, an approach to natural science called speculative philosophy, an approach to classical studies called Neuhumanismus, Wilhelm von Humboldt's role in revising the primary and secondary school system in the early 1800s; the concept of "Einheit der Wissenschaft" (i.e., the belief in the unity of learning, science, and scholarship); and the growth of the discipline of chemistry. Developments after the new foundation at Berlin that led to the mature German university encountered by American students in the second half of the nineteenth century are also considered. (SW)

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THE HISTORICAL DEVELOPMENT OF THE TEACHER-RESEARCHER IDEAL IN GERMANY AND THE U.S.A.

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A paper presented to the Annual Meeting of the Association for the Study of Higher Education

17 February 1987, San Diego, CA

HE 020 339

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This paper was presented at the Annual Meeting of the Association for the Study of Higher Education held at the San Diego Hilton in San Diego, California, February 14-17, 1987. This paper was reviewed by ASHE and was judged to be of high quality and of interest to others concerned with the research of higher education. It has therefore been selected to be included in the ERIC collection of ASHE conference papers.

One of the cardinal articles of faith in the ideology of higher education is that a professor should be both a teacher and a researcher. Briefly, this belief holds that the ideal academic, first, is one who is a master of and passes on an esoteric body of information to the next generation; second, is a trained researcher who adds to that body of information as well as teaching it; and, third, cannot perform the teaching function properly if not simultaneously active in productive research. The currency of this belief is attested to by a number of phenomena, such as the frequent practice of rating the prestige of institutions ostensibly devoted to education by their research output, the virtually universal criterion for the hiring and promoting of university teachers on the basis of their publication records, and the tradition of training potential instructors in higher education largely in techniques of doing research in a particular discipline. There is little difficulty in finding confirmation of confidence in this ideal at the macroscopic or institutional level. However, the empirical evidence for the validity of the belief in the case of individual faculty members is not particularly compelling when the correlation between publication record and rating of teaching performance is examined. In fact, the vast majority of teaching faculty produce little or no publishable research.

It is a commonplace that this ideal was the product of German universities in the late eighteenth and early nineteenth centuries, and that it was brought to the USA by American students in the second half of the nineteenth century. After being adapted to American standards, the concept spread to the remainder of the Western world in the early twentieth century and from there became almost universal.

It is also well known that this ideal arose in Germany at a time when it was undergoing a process of modernization and national development, showing great strides in the arts, sciences, industrialization, social organization, and military expansion. It is tempting, therefore, to conclude on an intuitive basis that the concept was an inevitable aspect of modern development whose validity is self-evident, and which the Germans were the first to recognize, with the United States and eventually the rest of the civilized world belatedly following their example in due time.

Although some early commentators on higher education subscribed to this conclusion, more recent historical studies have shown the reality of the situation to be more complex. The current assessment of the concept is summarized by Veysey's comment:

> The more one investigates the whole subject of German-American intellectual relations, the more one is impressed by their deceptiveness -- by the failure of the two cultures ever to achieve a geniune rapprochement on a broad, sustained basis. Instead, when looked at closely, the encounters between them seem tangential at best. Nineteenth-century Americans who were so enthusiastic about the German university betrayed great misunderstandings of the foreign scene. The American university of 1900 was created less as a result of direct copying from German models than through unconscious borrowing from bureaucratic industrial norms and practices closer to home.[1]

A number of recent studies of particular aspects of the etiology of this ideal in the development of the nineteenth-century German university have revealed more of the complexity of the evolution of the concept, and of how foreign it actually was to the North American context. I have attempted in this paper to integrate some of these findings to provide a better understanding of how the teacher/researcher ideal developed in Germany, and the discrepancies

between the original context of the concept and the American one to which it was supposedly transplanted. The focal point of this study is the foundation of the University of Berlin in 1810. However, to put this momentous event in perspective it will be necessary to first review some social, political, and intellectual developments of the eighteenth century. This will include descriptions of reforms at two earlier universities, Halle and Göttingen, and of the peculiarly German intellectual movements (and their inter-relations) of German Romanticism, German Idealism, Naturphilosophie, and Neuhumanismus, all of which are essential background to understanding the characteristics of the new University of Berlin. I will then survey the developments after the new foundation at Berlin that led to the mature German university encountered by American students in the second half of the nineteenth century.

SOCIAL AND POLITICAL BACKGROUND PRIOR TO 1810

What is referred to as "Germany" in this paper was, during the period under consideration (approximately 1700 to 1870), actually hundreds of states of various sizes and with varying sorts of government. In general, each state had a ruler (referred to as the "prince" or "monarch", for the sake of simplicity) whose power relative to the landed aristocracy differed from state to state and from time to time. In 1700 there were a total of twenty-eight universities in the German states other than Austria; England had only two universities at the same time. Most of these institutions had only miniscule enrollments (Heidelburg had around 80 students); however, most

maintained their precarious existences because they served local needs and local pride.[2]

Probably the single most important factor in understanding the development of the German university is that it has been, since its inception, a government-dominated institution. Unlike its French, English, and Italian counterparts, which were corporations of students or scholars that formed spontaneously to protect the interests of their members, the German medieval university had been planted by civil or ecclesiastical authorities with a view to the training of government functionaries and churchmen. It continued to be dependent on governments for financing and, at least in principle, subject to government approval in its appointment of faculty up to the period under examination. It must be realized, therefore, that, as an institution under government control and potentially important to government goals, and one frequently viewed by the ruling prince as reflecting his personal prestige, reform of the university was a topic of more than purely academic interest. Virtually the entire impetus of the German university reform movement came from outside the institution.[3]

During the late seventeenth and eighteenth centuries, the university as a trainer of bureaucrats became an intense interest of many German states, particularly Prussia. As Ringer has pointed out, the monarchs of a number of principalities began a power struggle with the landed aristrocracy during this period, and felt the need for an effective centralized civil service as a substitute for the previous feudal administrative system. To accomplish this they offered an increase in status and influence to those members of the burgher class

who achieved the necessary qualifications (such as training in law and economics) to participate in an expanding bureaucracy. In addition, increasing industrialization and urbanization contributed to an intensified need for professionals such as teachers, doctors, and pharmacists; entry into and practice in these areas was usually under government control as well. The monarch was thus given a powerful incentive to contribute to the well-being, and to encourage the effective organization, of institutions that were necessary for the creation of this cadre of professionals and officials. As a result princes showed a keen interest in monitoring and guiding any modifications that were proposed in the universities in their territories, and indeed frequently were the instigators of reform.[4]

However, the German aristocracy did not content itself with a passive or even reactionary attitude to developments in this area. As McClelland has described, the German aristocratic class at this time was an extremely heterogeneous group, whose lower orders were virtually indistinguishable in terms of wealth and status from the upper levels of the bourgeoisie. Less affluent nobles found it necessary to augment the insufficient incomes from their estates with stipends from court appointments, while all members of the aristocracy were anxious to preserve their political power by obtaining positions of influence in the state bureaucracy. As a result the nobility found itself with an interest in the development of institutions offering training oriented toward a career in the civil service.[5]

One result of this interest was the creation of the Ritterakademie, or "knightly academy". Basically an extended secondary school, the Ritterakademie offered instruction in useful subjects

(neglected by the universities with their scholastic curricula) such as mathematics and modern languages, as well as in socially important activities such as riding and fencing. These academies provided an attractive alternative to the universities at the end of the seventeenth century for the preparation of noblemen's sons for bureaucratic or diplomatic careers.[6]

During the eighteenth century a "mandarin class" began to form in Germany, defined by Ringer as "a social and cultural elite which owes its status primarily to educational qualifications, rather than to hereditary rights or wealth." This group was able to acquire considerable power in the period of the development of bureaucratic monarchy between the primarily agrarian economy of the feudal state dominated by the uncultured hereditary aristocracy and the beginning of full industrialization around 1870 to 1890 when they were challenged by wealthy entrepreneurs and popular political movements. The mandarins began to perceive themselves as a "spiritual nobility" and proposed that their education, originally valued as a practical learning indispensible for the administration of government, could produce a personal cultivation that was a substitute for the aristocracy of birth or wealth. This ideology of personal culture produced pressure on education to move beyond subject matter of purely pragmatic significance toward a curriculum believed able to enhance the humanity of the student.[7]

It has been suggested that the personal culture concept was reinforced by political developments (or the absence of them) in Germany at the time. Political reform movements were active in other European countries; reformers in Britain, for instance, were able to

find an avenue for their aspirations in the development of Parliament, while in France the Revolution produced political change when more moderate means were frustrated. In Germany, by contrast, liberal intellectuals could see hope in neither the development of more popular government through the cooperation of the autocratic monarchs nor in the likelihood of effective protest from the conservative and intimidated German populace. Anchor suggests it was reluctantly agreed that, as reform was impossible through direct political action, it would have to be brought about indirectly by a cultural and educational program to uplift the citizenry. "Political freedom they conceived to be a consequence of spiritual perfection, and social progress the effect, rather than the cause, of cultural reform. Hence the frequent, and inevitably doomed, attempts to turn theaters, universities, and scholarly journals into instruments of national regeneration."[8]

It can be seen that several factors of a social or political nature were perceived as important for eighteenth-century German higher education. The princes, who effectively controlled the universities, were anxious to use them to extend their personal power over the aristocracy by improving the effectiveness of the central state bureaucracy. The aristocracy responded by in turn making use of educational opportunities to protect their economic and political interests. Ambitious members of the bourgeoisie took advantage of this state of flux to advance their own status, power, and affluence closer to the position of the aristocracy, and reformers hoped to use education as a vehicle for political change that was impossible to achieve through more direct channels.

An important result of these interacting forces was the concept of Bildung. This term, often incompletely translated as "culture", means both more and less than that equally complex English word. To make comprehension of the concept more difficult it has changed its meaning over the period we are examining. It can be approximately understood as the freeing and development of the individual human personality and mentality to their fullest potentials through interaction with appropriate educational experiences. Bildung presumably was the elevated quality of humanity that distinguished the true aristocrat from the boorish peasant, and the advantage in freedom of spirit that the citizen of a liberated state would have over the sufferer of a repressive regime. It was a quality that the reformers of the German university wished to instill in its students.

THE UNIVERSITIES OF HALLE AND GOTTINGEN

The eighteenth century was, in general, a period of stagnation and disrepute for the German university. In medieval times the typical student, after undertaking his preparatory study, would have matriculated in the "lower" faculty of arts (usually titled "philosophy" in Germany) and, after having completed the work for a bachelor's degree, perhaps would have proceeded to one of the "professional" faculties of theology, law, or medicine. In all the faculties the journeyman/master distinction of the medieval craft guild had been maintained in the difference between the baccalaureate and the doctorate: the qualifications for only practising, as opposed to teaching, a profession. By the eighteenth century, however, theology and law were virtually the

only remaining functional faculties in the German university, and the doctorate was the only degree awarded. Medicine had become a profession passed on through apprenticeship, and virtually the only students who spent any time in the philosophy faculty were those requiring some remedial preparatory study before proceeding to professional training. Teachers were so poorly paid that most had to have another source of income to survive, student numbers had been reduced to the point at most institutions that they could at best barely function, and the reputation of the university was such that wealthy and aristocratic students had deserted it for the Ritterakademien.[9]

In France a similar atrophy had ended in the closure of the universities after the Revolution. However, this had been part of the general confiscation of church property, the French universities having been essentially ecclesiatical institutions. In Germany, by contrast, many universities were secular state institutions and ultimately perceived as reflections of the prestige of their benefactor princes. As such, some of their patrons were not prepared to allow them to disappear without some attempt at resuscitation. Interestingly, however, none of these revivals took place in existing universities: the two major instances of university reform prior to the founding of the University of Berlin in 1810 (Halle in 1694 and Göttingen in 1737) were also new foundations.

The University of Halle was created by grafting onto an existing Ritterakademie faculties of law and theology. The new faculty of theology was oriented toward Pietism, a doctrine which at the time emphasized the roles of active faith and emotional commitment over the scholastic orientation more common in contemporary academic religion.

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As a result the philosophy faculty was able to offer a broad and pragmatic curriculum without suffering the stultifying effect of being subordinate to a "superior" school of theology that had not progressed out of the Middle Ages, the condition of most German universities at the time. The law faculty also adopted a progressive stance, moving away from a scholastic orientation toward the study of jurisprudence. The general emphasis on the teaching of subject matter relevant to public administration, such as law and economics (known as "cameralistic studies"), and the innovation of lectures presented in German rather than Latin, contributed to Halle's rapidly acquiring one of the largest number of students in Germany, including a high proportion of well-to-do aristocrats.[10]

Göttingen University was created by the state of Hanover, which had not previously had a university. The leading figure in its foundation was G.A. von Münchhausen, a prominent Hanoverian privy counsellor who had studied at Halle. Hanover, like other modernizing German states at the time, felt the need of an institution that could provide adequate training for civil servants. At the same time local pride was bruised by the necessity of having to travel to a "foreign" neighboring state to obtain this education.

Mindful of the competition for students that the new foundation faced from the many existing universities, and of the fact that Halle with its novel features had prospered in the face of such odds, Münchhausen set out to emulate the success of his <u>alma mater</u> with his new institution. He was particularly anxious to attract a wealthy and aristocratic student body from outside Hanover for the prestige and income this would bring. He recruited prominent scholars to Göttingen

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with promises of generous salaries, in order to establish a high profile for the institution from the beginning. He emphasized such subjects as modern history, applied mathematics, and geography in the philosophy faculty to increase its attractiveness to practically minded students. In the same vein, the law faculty, which was the backbone of the university, offered a curriculum of legal studies strongly oriented toward the interests of the landed aristocracy. (Not coincidentally, the reigning monarch of Hanover was also occupied with being George II of Great Britain at the time, and most of the financing of Göttingen was provided by the Hanoverian nobility.)

Münchhausen also took a number of preventative steps to avoid offending potential foreign students. Roman Catholic students were guaranteed the right to practise their faith. Aware that the Universities of Halle and Leipzig had suffered severely from religious disputes among faculty, he endeavoured to hire professors who were neutral on doctrinal issues, and created university statutes forbidding the denunciation of teachers for "heretical" opinions. These measures, instituted originally for material motives, were later to contribute to a previously unknown atmosphere of academic freedom at Göttingen. However, in accomplishing this end it must be remembered that the state exercised absolute authority over the appointment of new teachers. The only right the existing faculty had in this area was to nominate possible candidates -- if and when they were asked.[11]

To sum up, Halle and Gottingen were founded as reformed universities primarily due to a policy of using them to train civil servants, to attract wealthy students to provide revenue for the local economies, and to add to the prestige of the rulers who had sponsored them. In

accomplishing these "mercantilistic" objectives, however, the founders used as expedient measures the recruiting of prominent scholars and the reduction of internecine conflict within the institution. Whether by accident or by design, this created an environment that led to genuine academic advances, especially at Göttingen.

First, instructional methods broke away from their medieval traditions. Lectures were centered on a systematic survey of a field, often inspired by the lecturer's own research, instead of providing a dictation with commentary of a canonical text. Lectures were given in the vernacular, rather than in Latin. In place of the medieval disputation students took part in research seminars where they were taught how to look for the answers to specific questions. In short, the goal of teaching changed from the passing on of a body of knowledge conceived of as finite and fixed to showing students how to best answer questions of a body of knowledge conceived of as infinite.

Second, the subject matter of the curriculum changed. The medieval scholastic version of the Aristotelian tradition, which had subjected philosophy to theology, was abandoned and replaced by a rational study of such areas as law and natural science. Classical studies moved from the analysis of standard Latin and Greek works as models for correct writing to the study of the literature of a particular culture with the aim of better understanding the people who had produced it. To this end, philology developed methods of linguistic analysis of written materials as diverse as the Bible, the poetry of Homer, and German folktales.[12]

Opinions vary as to what effect Halle and Göttingen had on contemporary German universities, ranging from the almost fulsome

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("Under their leadership a complete reformation of the entire German university system was brought about...."[13]) to the skeptical ("Other German universities did not rush to follow the lead of the new-model institutions."[14]) However, it is obvious that when the University of Berlin (which was of great influence on other institutions) was being planned, the lessons to be learned from Halle and Göttingen were carefully considered.

ROMANTICISM

The Romantic Period is usually considered to have occurred between (give or take a couple of decades) 1780 to 1850, and there is general agreement that a particularly intense manifestation of the movement took place in Germany. The University of Berlin having been founded in 1810, in the middle of this period, it would seem reasonable to ask what effect this movement might have had on the development of German higher education. Little work seems to have been done in this area; I hope at least partially to remedy that gap in this paper.

One difficulty that hampers answering this question is arriving at an understanding of what Romanticism is. A beginning can be made by noting that it is generally considered to have been a reaction to the Enlightenment, an intellectual movement that broke away from traditional explanations and proposed that empirical investigation and rational analysis could be of great benefit to humanity in discovering the universal laws presumed to govern natural processes. However, noting that Romanticism is essentially a reaction immediately leads to a difficulty: "There is no Romantic system, in the sense that there is

a philosophy of the [Enlightenment], for a Romantic system could only be negative.... Once universal principles are repudiated, nothing is left except the special, the individual, case...."[15] We face the paradox that, in rebelling against the Enlightenment belief in universal natural law, the Romanticists proposed in its place the understanding of individual cases. However, this principle of individuality itself became a universal principle in the minds of its proponents, albeit a complex one.

> It is this universality that confers upon [the Romantic mentality] its historical importance. For here we have to deal not with a number of special cases which can be explained by analysis by experts, literary critics, or psychiatrists, but with a mode of thinking shared by a very large number of contemporaries -- and hence, a social fact. The fact is determinant for the life of every individual in every sphere; it is the level on which he moves, the atmosphere he breathes; it is in existence before anyone is conscious of it, for nothing is harder than to realize the precise significance of a cast of mind.[16]

One difficulty in comprehending the significance of Romanticism for higher education is that the term is often narrowly defined as the "Romantic Movement" in art, literature, and music. However, in the German context it must be realized that we are considering more than a set of artistic standards -- it was nothing short of a world-view that had considerable influence on how people carried on their day-to-day activities.

> In German culture one may, I believe, legitimately talk of a Romantic tradition which has a central position in the unfolding of modern German spiritual, intellectual and political life and in the constitution of the national German psyche. It is a complex tradition, drawn from a complex pattern of historical impulses, the reality of whose existence is not disproven by difficulties of definition.[17]

Furthermore, unlike other countries where Romanticism tended to typify Bohemian elements outside the mainstream of society, in Germany it

found many proponents in respected and influential members of the establishment.[18]

The Romantic movement arose "out of a sense of the inadequacy of the dominant ideas of the Enlightment and of the society which produced them.... Romanticism was the new thought, the critical ideas, the creative or despairing efforts to cope with old ways of confronting experience."[19] According to the thinkers of the Enlightenment, the physical world is Newtonian, orderly, symmetrical, regular, repetitive, and maintains static equilibrium. Universal truths are the object of science and philosophy and are subject to mathematical laws. Human society, as well as the physical world, is the legitimate object of scientific investigation, and the laws of social organization can be modeled on those of the machine. They are rationally determined, and are independent of the events of the past.[20]

Romanticism rejected a science, physical or human, dominated by physics and mechanism. "The universe Romanticists believed in was an expanding, evolving universe; their concern moved from physics to biology and from planets to plants.... Nature came to be viewed historically -- a developing world, continual process, and continual growth could only be understood by historical thinking."[21]

In addition to appealing to a biological world, in contrast to a mechanical one, the Romanticists went even further in appealing to an unseen, supernatural world, not amenable to any sort of scientific method. This world could be known only through intuition.

> Men could learn not just through experiment and induction, or by logical processes, but in intuitive flashes, by trusting their instincts. Romanticists tended to distrust calculation and stressed the limitations of scientific knowledge. It was held that the rational counters of scientific abstractions fail to apprehend the variety and fullness of reality, that the process of rational analysis

> destroys the integrity of naive experience of the stream of sensation and in this violation misleads the knower into error.[22]

Not only had the thinkers of the Enlightenment misjudged the nature of the world, argued the Romanticists, but they had misunderstood the workings of the human mind as well. They created an artificial distinction between rational thought and emotional feeling. For the Romanticist these two psychological processes were one and the same.

> This deliberate fusion of feeling and thought is one of the most noteworthy characteristics of Romanticism and a trait peculiar to Germany at those periods of its history in which Romanticism gains the upper hand. The German does not recognize the dichotomy of thought and feeling.... He wants to be totally possessed and demands a total satisfaction unprocurable by critical thinking. Instead of thinking an idea and feeling an emotion, he maintains that he can understand and feel an idea.[23]

Considering how the Romanticist viewed the way that the world and the mind work, it is not surprising that his lifestyle would also differ from that of the Enlightenment thinker. He did not believe that events occurred in a structured or predictable order, or that they could be understood by some process of natural law; why then should he behave in a way that the Enlightenment would term "rational"?

> The definition of the Romantic, then, comes down essentially to a faith in the miraculous. All his other traits are merely consequential. The primacy accorded to faith over intellect, to inspiration over hard work, to revolution over reform are only differing expressions of this faith.[24]

How was the Romanticist to live his life? What principles were there to guide the person who had virtually abandoned the principle of principle? Unlike the disciple of the Enlightenment, who believed that there exist pre-ordained laws that are there for all to discover, the Romanticist felt that he lived in his own individual world, and that

only he could structure it by his own efforts.

> Romantic striving may therefore be summed up as the effort to create order out of experience individually acquired. It is a striving because human experience does not automatically dictate its own forms or point out its own values. That the task of man is to discover these for himself is shown by his possession of energies and desires.
>
> Accordingly, romantic life is led in two directions -- union with God, conceived either traditionally or pantheistically, or metaphysically; and work for mankind, conceived in the form of either social improvement, or the creation of art, or the application of science.[25]

For the Romanticist, then, the only limits to what he could achieve were those set by his own aspirations and intuitive abilities. Romantic heroes need not confine their strivings to such conventional Romantic goals as Romantic love or Romantic war; they could be equally at home in Romantic science, where their heroic qualities would be called "genius". At the beginning of the nineteenth century they could "adopt a demonic stance, a rejection of traditional limits, of the very limits of the human condition itself, especially the limits of human knowledge. With the chronological conjunction of such figures [as the Goethian and Byronic heroes] with the Napoleonic legend, intellectuals had models that showed similar desires both for a nearly sacriligious overthrow of an old society and for a nearly sacriligious effort to extend knowledge.... The very thirst for genius and its cult led to a wide variety of efforts made by men seeking to satisfy themselves that they had genius."[26] So the Romanticist would work in his chosen field, realizing that his efforts would, in all probability, accomplish little, but would be "always prepared for the evangel which will summon him from his temporary occupations and thrust him on the path to glory."[27]

Paradoxical though the term "Romantic science" may seem to the modern mind, it definitely existed at the time of the conception of the Humboldtian university and had powerful effects on it. In later parts of this paper I will describe how these effects can be seen in the perceptions of the architects of the University of Berlin of how an institution should function, of how the learning and teaching process operates, of the nature of the professional career, and in the conceptions of academics of the nature of knowledge.

GERMAN IDEALISM

The philosophical school of German Idealism is a complex and difficult topic, and one that has been described elsewhere. Moreover, I do not intend to discuss its impact on higher education at any great length. It will be sufficient for the purposes of this paper to provide only a general impression of the subject by briefly describing two theorists, Kant and Fichte.

Immanuel Kant proposed that the worlds of appearance and of reality are completely separate entities. The world of appearance is a creation of the mind working on the raw material of sensation. In producing this world, however, the mind makes use of intuitive a priori perceptual categories such as time and space to organize sensory input, and our perceptions of phenomena are as much a product of the organizing effects of these perceptual categories as they are of the sensory properties being organized. In the world of reality, however, dimensions such as time and space do not necessarily exist, and the "things-in-themselves" that occupy this world presumably do not have spatial or

temporal or other "physical" qualities. However, as the mind is only capable of appreciating the world of appearance, the true properties of the contents of the world of reality are unknowable. A more accurate route to this sort of understanding will come through rational analysis.

For the Romanticists, Kant's concept of fixed and universal perceptual categories was unacceptable, although they approved of his hypothesis of the mind creating the experienced world. J.G. Fichte resolved the conflict by eliminating the distinction between the worlds of reality and appearance. There is, he proposed, but a single world, which is created by the individual's mind, or ego.

> The first supreme action of the ego is to posit itself -- the Romantic interpretation of the Cartesian cogito ergo sum -- and thence to fulfil its nature in infinite activity. Activity is only possible in terms of objects; but as Fichte has discarded the Kantian [things in the real world], and objects no longer exist ["in-themselves"], they must be created. Ego and non-ego, subject and object, thus depend on each other; the ego is primary, but it needs the non-ego in order to realize itself, and this objectification of the ego is the basic act of creation, leading to the infinite succession of ego/non-ego relationships which constitute the world, itself a dynamic concept to Fichte.[29]

Kant's point that the phenomena we perceive do not necessarily give us a direct picture of an objective world existing independent of the observer had been preserved, so his argument for a Rationalist, as opposed to an Empiricist, approach to understanding reality still stood. However, the "real" world thus analyzed no longer had any existence independent of the observer (or, perhaps more accurately, thinker); it was the creation of the individual mind for Fichte. So the Romanticist distaste for the empirical observation and rational analysis of sensory data had, if anything, been made more extreme by

adopting this philosophic position. The sensory world was actually just a creation of the mind.

NATURPHILOSOPHIE

The concomitance of the movements of Romanticism and German Idealism resulted in a peculiar, at times even bizarre, approach to natural science during the 1790's termed Naturphilosophie (better translated as "speculative philosophy", rather than the more literal "natural philosophy"), in which the philosopher F. von Schelling played a leading part.

> Naturphilosophie consisted of very broad and general views about the world. It can be traced back to the Platonic belief in the rationality of the world.... In Naturphilosophie, an important idea is that because the human mind is a part of nature and reflects nature, the laws of our reason must resemble those of nature, and we could therefore hope to make scientific discoveries from an armchair. This is really a version of the old belief in the analogy between the microcosm, man, and the macrocosm, the great world of nature. But it seemed more up-to-date because Kant had argued that the categories into which we organize knowledge are arrived at independently of experience; the idea that empirical knowledge could be attained a priori was not extraordinary in Schelling's Germany.... Whereas Rationalists had seemed to give the impression that everything could already be explained in principle, to Romantics there now opened up a vast but misty vision of a much more organic universe. The prospects for science became indefinite.[30]

On the positive side of the ledger for this view of science was its amenability to progress in certain fields, such as physiology (where the organic approach was appropriate) and the theory of the conservation and convertibility of energy through various forms such as magnetic fields to electric currents to heat. It also encouraged a synthesizing and integrative view of science, regarding it as a branch of philosophy.[31] On the debit side, however, it had a disastrously

inhibitory effect on empirical work in fields such as chemistry.[32] Its followers "looked with contempt upon the slow and laborious work of experimental scientists and heaped abuse on Sir Isaac Newton for having perpetrated a mechanistic conception of the universe. To their own serious deficiencies their minds remained closed. It escaped them that all they had done was to replace the tested methods of science by pure fantasy and arbitrary ideas to which, by employing superficial arguments by analogy, they lent at times a semblance of systematic thought."[33]

NEUHUMANISMUS

One of the developments pioneered by the University of Göttingen at the close of the nineteenth century was a new approach to classical studies. No longer were Latin and Greek learned simply as a matter of mental discipline or as a social shibboleth, or as an introduction to a literature whose style was to be emulated. The study of classical literature, especially Greek, was felt to lead to a spiritual uplifting. The Göttingen philologists, in Paulsen's words, "found a new point of view for the treatment of the classical authors: the study of the classics was no longer to be a useless erudition, nor yet an imitation of Greek and Latin models, but a living, cultural intercourse with the classical authors as the highest patterns of art and taste. This was the viewpoint of the new humanism through which the study of antiquity once more acquired a reasonable and human purpose: the cultivation of a sense and taste for the beautiful and sublime in literature."[34]

What Paulsen referred to as a "living, cultural intercourse with the classical authors in eighteenth-century Göttingen had in 1809 became for Georg Hegel something more emotive:

> The perfection and glory of these literary works of art must be the intellectual immersion, the profane baptism which shall give to the soul the first and inalienable tone and tincture for taste and scholarship. And for this dedication no general superficial acquaintance is adequate, but we must board and lodge ourselves with them....[35]

For the chief architect of the University of Berlin, Wilhelm von Humboldt, even Hegel's fervent prayer was inadequate:

> Knowledge of the Greeks is not merely pleasant, useful or necessary for us -- no, in the Greeks alone we find the ideal of that which we ourselves should like to be and produce. If every other part of history enriches us with its human wisdom and experience then from the Greeks we take something more than earthly -- something almost godlike ....
>
> Only our ability to transfer our spirits into those times of antiquity can lift our hearts and widen our mind's horizon and recreate for us our original, not so much lost as never possessed, human freedom, so that we can return with fresh courage to our own, so very different situation. Only from their never-drying wellspring can we take our true inspiration.[36]

From the preceding quotations the correctness of Diehl's disapproval of translating Neuhumanismus simply as "new humanism" or "neohumanism" must be self-evident.[37] Neuhumanismus entailed the belief that the ancient Greeks had developed the perfect civilization, one which could never again be equalled. The modern world could participate in their invention, however, through the artifacts they had left us: their art and literature. But this could not be accomplished through mere contact with the classics in translation, or even by studying the originals with a contemporary point of view. It required, in Hegel's words, an "intellectual immersion". For Humboldt, we must "transfer our spirits into those times of antiquity." The reader had to use

Greek literature as a sort of vehicle for time travel to experience Greek culture, in order to derive the same benefits from it that Plato had enjoyed. By so doing one could recreate one's "original, not so much lost as never possessed, human freedom". Neuhumanismus, in otherwords, sought to achieve Bildung through classical studies.

To get the utmost from Greek literature, however, required more than just the ability to read Greek. The reader had to be able to appreciate the technicalities of the language, as well as the content of the literary work. Philology had begun as an adjunct of theology that enabled churchmen to decipher the true word of God from the abstruse and often garbled texts handed down from ancient times that constituted the Holy Scriptures. This tool came to be put to work analyzing the Greek classics, but with a different form of salvation in mind. Philology thus became a discipline whose study could lead to a cultivated mind.

UNIVERSITY OF BERLIN, 1810

In 1800, Berlin had recently blossomed from a stagnant provincial town into a cosmopolitan center of social and intellectual activity. K.F. Beyme, a Prussian government minister, began a campaign to have an educational institution founded to augment the activity of the existing Academy of Arts and Sciences. Several essays and public lectures were addressed to the topic of educational reform in general and a University of Berlin in particular by a number of prominent scholars, among them the philosophers J.G. Fichte, F.W. Schelling, and F.D. Schleiermacher.[38]

Napoleon's defeat of the Prussian armies in 1806 and occupation of part of the country precipitated a profound crisis that accelerated the existing reform movements. The French shut down the universities of Halle and Jena (in Saxe-Weimar, part of the Prussian sphere of influence). The Prussian government decided to replace these facilities with a new university in Berlin, and to simultaneously revamp the primary and secondary school systems. The person chosen in 1809 to supervise this rebuilding was Wilhelm von Humboldt.

In many respects Humboldt was an unlikely candidate for the job. A respected amateur scholar in the fields of classical studies and philology, he was not an academic, nor did he display any notable enthusiasm for university work. Although he lived the last fifteen years of his life in Berlin, he was not known to have had any involvement in that time with the institution whose birth he presided over, and he once wrote his wife that directing a group of scholars "is not much better than to have a troop of comedians under you".[40] Nor was he any better qualified to overhaul the school system. "He, the noble, educated by tutors after the fashion of the age and of his class, had never even seen a school and never read a book on education."[41] A career diplomat, he reluctantly accepted the assignment under duress from his friends, who were concerned that a bureaucrat would take on the task if he refused, and from the Prussian government, which promised a speedy conclusion to the project and a foreign posting when it was completed. He finished his work in a bare sixteen months, and was the Prussian ambassador in Vienna when the new University of Berlin opened for instruction.[42]

Humboldt's apparent views on the new institution he fathered have come down to us largely through a single document described as "a brief fragment of an internal ministry memorandum,"[43] discovered in a file drawer and published over sixty years after his death. It is terse and polemical, congruent with one opinion that it represents part of a petition to the King describing (and briefly justifying) the roposed philosophy and operating procedures of the new university.[44] It is worth quoting in some detail several excerpts from this document.

First, what is revealed about the goals of the institution? The opening paragraph indicates that it was Bildung that was sought.

> The idea of disciplined intellectual activity, embodied in institutions, is the most valuable element of the moral culture of the nation. These intellectual institutions have as their task the cultivation of science and scholarship (Wissenschaft) in the deepest and broadest sense. It is the calling of these intellectual institutions to devote themselves to the elaboration of the uncontrived substance of intellectual and moral culture, growing from an uncontrived inner necessity.
>
> Their essence, manifested in the individual, consists of the combination of objective scientific and scholarly knowledge with the development of the person....
>
> One unique feature of higher intellectual institutions is that they conceive of science and scholarship as dealing with ultimately inexhaustible tasks: this means that they are engaged in an unceasing process of inquiry.[45]

This, of course, is the proposition put forward in the previous century at Halle and Göttingen: education comes, not from the absorption of a fixed, conventional body of knowledge, but through the search for yet undiscovered knowledge, or "research".

Second, the memorandum makes specific how that search for knowledge is best carried out. It is to be done on a cooperative, not individual, basis.

> The intellectual exertions of men, however, only prosper through a process of collaboration. This does not mean merely that one individual supplies what another lacks.

> Collaboration operates through a process in which the successful intellectual achievements of one person arouse the intellectual passions and enthusiasms of others, and through the fact that what was at first expressed only by one individual becomes a common intellectual possession instead of fading away in isolation. Given the collective character of individual accomplishment, the inner life of these higher institutions must be such as to call forth and sustain a continuously self-renewing, wholly uncoerced and disinterested collaboration.[46]

Furthermore, this collaboration is not simply a matter of interaction between members of a team of peers; it involves the teacher-student relationship.

> The teacher does not exist for the sake of the student; both teacher and student have their justification in the common pursuit of knowledge. The teacher's performance depends on the student's presence and interest -- without this science and scholarship could not grow. If the students who are to form his audience did not come before him of their own free will, he, in his quest for knowledge, would have to seek them out. The goals of science and scholarship are worked towards most effectively through the synthesis of the teacher's and the students' dispositions.... The two together are a fruitful combination.[47]

The point that seems to be indicated here is that "science and scholarship", which in earlier passages had been described as an organic unity between research and education, can only occur within the context of the teacher-student relationship. This proposal has a distinctly Fichtean cast: recall the passage quoted earlier paraphrasing Fichte's view on the relationship between the "mental" and "objective" worlds: "Ego and non-ego, subject and object, thus depend on each other; the ego is primary, but it needs the non-ego in order to realize itself, and this objectification of the ego is the basic act of creation, leading to the infinite succession of ego/non-ego relationships which constitute the world."

It has been pointed out that Humboldt must have had difficulty making this statement about the necessity for collaboration, as he

personally seemed to find little need to seek out students in his quest for knowledge. Nor, apparently, did his brother Alexander, the renowned natural scientist, nor the philosopher Schiller, or a host of other productive scholars of his acquaintance.[48] As if to provide an escape clause, he states in a later section of the memorandum: "At every large university there are always some men who teach little or not at all and who devote themselves entirely to solitary study and research. It would be entirely safe to entrust the growth of scientific and scholarly knowledge to the universities as long as they are properly conducted...."[49] Apparently the rule proposed can tolerate a few exceptions.

The document offers some specific advice on how the research/teaching process should be conducted. On what should be avoided: clearly, any research of a predominantly empirical nature.

> As soon as one ceases to pursue scientific and scholarly knowledge or imagines that it need not be pursued from the utmost depths of the mind and when one comes to believe that it can be cultivated simply by piling up unconnected facts, then the cause of learning is irremediably and permanently lost. If such an attitude is held for a long time, science and scholarship become dissipated; when this happens only their language survives as an empty shell.[50]

What should be emphasized?

> Now, in order to avoid this wrong path, there must be a lively and spirited exertion of the intellect in three directions: first, all understanding in the wider sense must be sought by the application of a fundamental principle to explanations of natural events which penetrate from mechanical to dynamic, organic and ultimately psychological levels; all efforts at understanding should be directed towards an ideal; and ultimately, the principle and the ideals should be fused into a coherent idea.[51]

Humboldt is appealing here to the concept of Einheit der Wissenschaft, the belief in the unity of learning, science, and

scholarship. According to this concept "Wissenschaft is an organism, an active force which is alive in all its branches and which unites them in each other. The University is thus the institution where each subject is recognised in its connection with Wissenschaft in general, where each subject prosecutes its own Wissenschaft as an ideal in itself while yet being conscious of its existence as a part of the greater ideal of total Wissenschaft. Thus all the members of the university do and seek one and the same thing: the ideal of Wissenschaft, and Wissenschaft itself becomes an attitude of mind in relation to the world in general."[52] Belief in this assumption gave the architects of the new university the faith that properly prepared students could be given complete freedom in choosing their subjects of study; whatever their entry point into Wissenschaft, its essential unity would take them all to the same destination.

On the subject matter most appropriate for the research/teaching process:

> This tendency towards depth and breadth is found mostly and in its most pronounced form in philosophy and art. Quite apart from their inherent inclination to decay, little is to be expected of them if their essential spirit is not appropriately expressed in other branches of knowledge and categories of research, or if it is applied there only in a logically or mathematically formalised manner.[53]

Humboldt did not wish to bar the natural sciences entirely from the university. However, he was concerned that they would have a tendency to move toward excessively empirical or utilitarian research and away from the concept of Einheit der Wissenschaft unless some form of check was not imposed on them. He proposed to accomplish this by placing this sort of research under the safe control of appropriate disciplines within the philosophy faculty such as "natural philosophy",

housing it in an out-and-out professional faculty such as medicine (many chemists received such appointments as pharmacists), or relegating it to a separate Technical University.[53]

What were the administrative arrangements that would be necessary to bring about the desired activities? The Romantic nature of the Humboldtian university is vividly revealed in the policy advocated toward this end. Essentially, the whole process would occur naturally with very little contrivance.

> Now as regards the organisational and material side of the relationship of the institution to the state, the only concerns of the latter must be the profusion (in the sense of mental power and variety) of intellectual talents to be brought together in the institution. This can be achieved through care in the selection of persons and the assurance of freedom in their intellectual activities .... The heart of the matter is the appointment of the persons who are to do the intellectual work..... Once appointment policy is taken care of, the next thing is the drawing up of organisational statutes, which should in general be few and simple but more effectively articulated than is usually the case.[54]

"Appointment policy" was apparently easily settled:

> Since every form of one-sidedness must be excluded from higher intellectual institutions, there will naturally be many who are active in them to whom this tendency towards depth and breadth is alien and there will be some to whom it is repugnant. In its pure and unqualified form, this tendency will, in any case, be found only in a handful of persons. It need, however, find expression only occasionally, here and there, to have a widespread and enduring effect.....
>
> If, however, the principle of cultivating science and scholarship for their own sake is placed in a dominant position in higher intellectual institutions, other matters may be disregarded. Neither unity nor full-roundedness will then be lacking; each naturally fosters the other and a proper balance will thereby be maintained. This is the secret of good research method.[55]

Humboldt's institution when it became operational was a "university of full professors, an affirmation in a romantic era of a

heroic model."[56] The only faculty members with full rights and authority were the full professors, who controlled the "institutes" (or departments), including access to research facilities and awarding of degrees. Appointment as full professor normally came late in a scholar's career, as the result of an outstanding publication record, and usually only to fill a vacated existing chair. The lowest and most numerous faculty member was termed a Privatdozent; such a position would be awarded to graduates who had built up moderate publication records. The Privatdozenten could (with the professor's agreement) teach courses for which they charged fees directly from the students, but they received no salary. They were expected to survive on such financial arrangmenets and continue to perform research (with no responsibility by the university for assistance), with the hope (but with no guarantee) that on building a brilliant reputation they might be appointed to a chair. There were generally many more Privatdozenten then could possibly expect to receive a permanent apopintment; in fact, subsequent university expansion to meet increased student enrollments was usually accomplished by appointing more Privatdozenten than creating new chairs. This policy, however, was not considered as deliberately exploititive. "The conception of a professionally qualified research worker did not exist early in the nineteenth century anywhere, since research was considered as a charismatic activity which could be sucessfully pursued only by an inspired few.... In Germany, research was not recognised as a profession; it was a sacred calling or vocation for very few persons, who needed no formal training beyond what was offered for the standard degree courses; there was no conception of a career leading to the top by gradual steps. The

highest positions were rewards for exceptional accomplishment rather than the orderly culmination of a career."[57] The scholars who received these rewards were also the ones who, in Humboldt's words, were the "handful of persons" possessing "the profusion ... of intellectual talents to be brought together in the institution" that would spontaneously lead to science and scholarship. As Max Weber (among countless others) observed, many were called, but few were chosen.[58]

Not only the professors were chosen; the students were a special breed as well, having undergone a secondary-school curriculum designed to lead to science and scholarship. Humboldt was able to see to that, as he also had the task of redesigning the school system.

> The aim of the schools must be the harmonious development of all the capacities of their pupils.... Knowledge should be so implanted in the mind of the pupil that understanding, knowledge and creativity excite it, not through any external features, but through their inner precision, harmony and beauty. To this end, and for the preliminary training of the intellect for pure science and scholarship, mathematics above all should be employed ....
>
> A mind which has been trained in this way will spontaneously aspire to science and scholarship.[59]

Some concluding comments are in order. First, it is obvious that the "search for knowledge" being described in this document is not the empirical investigation, often for utilitarian ends, that we frequently call "research" today. It was rather the acquisition of that intellectual variety of liberal education that Humboldt (and his contemporaries) called Bildung. "The criterion of Bildung, culture, is thus not the possession of knowledge, but rather the effect that the acquiring of such knowledge has on the individual, and even though he may forget all of it, Bildung, culture, will remain, as well as the ability to proceed to the acquisition of more and more knowledge.

This is the liberal humanistic ideal with its magnificent disregard for and rejection of the utilitarian approach to education, and it is interesting to remember that that which we are nowadays fond of calling 'the scientific approach' has its origins in the liberal humanistic ideas of this era."[60]

Furthermore, this concept of research was solidly based on assumptions derived from German Idealism, Romanticism, and their offshoot, Naturphilosophie. The Einheit der Wissenschaft, the repugnance for empirical investigation, the organismic view of the university, the heroic view of the full professor in contrast to the proletarian Privatdozent waiting for "the evangel which would summon him from his temporary occupations and thrust him on the path to glory;" all were manifestations of a unique vision of the university mission.

It might be noted in passing that this vision was more than institutional in that it motivated individual scholars as well. McClelland picks out the historian Leopold von Ranke, the chemist Justus von Liebig, and the naturalist Alexander von Humboldt as examples of the dozens of scientists and scholars who "were convinced that the knowledge of their predecessors was superficial at best, and that bold acts of intelligence and will by the single scholar could uncover the profound secrets of the human world and the universe beyond."[61] They regarded their mission as a sort of quest for the Holy Grail rather than a mundane career, and demanded superhuman sacrifices of themselves and expected the same of their students. Good describes a legend associated with Liebig: "As the charismatic centre of the laboratory's activites, Liebig even expected his students to undergo considerable physical pain in the cause of the advancement of

chemical Wissenschaft. When he first prepared anhydrous formic acid he ordered several students to bare their arms on which he dabbed the corrosive liquid: they complied unflinchingly. Such was the esprit de corps he engendered and sustained."[62]

Second, there seems little reason to regard this memorandum as an idiosyncratic expression of Humboldt's personal views. The document is attributed to Humboldt because it is in his handwriting; as was noted above, some of its contents are out of character for Humboldt and it makes no mention of his favorite discipline and "well-spring" of Bildung, Greek literature. It would seem more appropriate to consider it as a consensual summary of the different sources of opinion and advice that had been put forward concerning the new institution. In fact, it has been suggested that the stock modern reference to the "Humboldtian university ideal" is rather ironic, considering what little substantial input that he probably contributed to the concept when contrasted with the published essays on the subject by Fichte and others. It appears more likely that his major role in the creation of the University of Berlin was the mediation and merging of the sometimes conflicting academic proposals from different quarters into a concrete plan that would be agreed to by the Prussian government.[63]

Third, the freedom of intellectual activities referred to was extended to both faculty and students. Lehrfreiheit was the privilege of the professor to choose whatever subject of inquiry he wished. (However, it did not give him the right to become involved with unorthodox political causes; after all, he was a civil servant.) Lernfreiheit was the corresponding right of the student to pursue whatever questions intrigued him, at whatever university he felt was

most suited to assist him in his search. There was no set curriculum to be mastered to be awarded a degree; students registered for whichever courses of lectures they pleased, and attended those lectures only if they pleased.[64]

However, except for the student who merely wished to attend university for sheer intellectual stimulation, this freedom proved limited. If he wished to obtain a degree, he had to register with a full professor to have his thesis research supervised. The professor was under no obligation to accept any student, and could stipulate what courses he must take. If the student was awarded the degree, he would find that he had a certificate saying that he was a cultivated person, but little more. Entry into most government jobs and professions was dependent on passing an appropriate state examination; although in theory these tests were government-administered, in practice the government contracted with professors to construct and administer the tests, and university courses were designed to aid in preparation for them. In point of fact the great majority of students did not proceed toward degrees or even enroll in the seminars that taught the research procedures necessary to carry out advanced investigation. Rather, they registered in the lecture courses that prepared them for the professional examinations in which they were interested. Even the philosophy faculty became largely quasi-professional, as it provided the instruction leading to the qualification required for teaching in the Gymnasia, the reformed secondary schools that Humboldt had created. The government, while imposing no internal requirements on the university to provide utilitarian instruction, provided external incentives that accomplished virtually the same effect.[65]

THE MATURE GERMAN UNIVERSITY

The University of Berlin opened in October, 1810, with a faculty handpicked by Humboldt. However, it did not stick for long to the course he had plotted for it.

> Many of the assumptions on which the new German university rested were questionable and became patently untenable as the century proceeded. Even in the beginning, the spark of idealistic scholarship did not set every student aflame, while many, abusing academic freedom, did not even expose themselves to this idealistic experience. Otto von Bismarck was only one among the innumerable students who avoided every contact with the ideal life of the university. He lived in and for the student corporation to which he belonged and finally prepared himself for his law examination by cramming. These corporations, however, did not cultivate the spirit of scholarship but only successfully attempted to impose on their members the social forms and manners of junkerdom, which were incompatible with the intentions of Humboldt's university.[66]

Although a small minority of students approached Wissenschaft with minds that "spontaneously aspire to science and scholarship", for the majority Humboldt's ideal was the elegant figurehead on an institution whose function was most comparable to that of a commercial freighter.

Nor did the heroic full professors continue to carry out the Idealistic role Humboldt has envisaged for them; Humboldt's ideal of Wissenschaft soon collapsed like a house of cards. German Idealism was replaced by other philosophic movements, and the "speculative philosophy" of Naturphilosophie was overthrown by a more empirical group of scientists smarting from their long exile in the wilderness. Paulsen, writing at the turn of the twentieth century, describes the situation:

> In the third decade of the century the interest in philosophy was suppressed by the great rise of natural-scientific research. The speculative tendency,

> originating with Kant, but going beyond the limits he had fixed for it, and which with great boldness and even arrogance, undertook to construct nature and history a priori in the form of a logically necessary system, fell into contempt. As a matter of fact, for more than a generation philosophy stood under the ban of distrust and disdain, the result of the failure of its flighty enterprises. Only during the last decades did this contempt gradually disappear and philosophy again achieve a peaceful and fruitful relation with the sciences....[67]

In a violent reaction to the ethereal approach adopted by their predecessors, the new generation of natural scientists plunged with a vengeance into nuts-and-bolts laboratory work and sneered at attempts at speculative or integrative theorizing.

Ironically, the realization of Humboldt's fears that natural science might pursue an empirical path independent of philosophy seems to have been partly brought to pass by developments arising out of his beloved disciplines of classical studies and philology. The earliest university activities that could be characterized as "research" were the seminars for teachers begun in the eighteenth century in the theology faculty at Halle. These were informal gatherings of a professor, often in his home, and a few select students. Their intent was to augment the dogmatic transmission of prescribed knowledge in lectures with information on how that knowledge had been arrived at. As Paulsen put it, "it is not enough in the mental sciences to know the organization of the Carolingian Empire, or the origin of the Pentateuch, one should also understand on what our knowledge of these things is based and how it has been acquired. Only he who knows the way to the sources and is able to draw from them, possesses original, scientific knowledge."[68] Two interesting observations can be made

in passing of these seminars; they appear to have been one of the few spontaneous internal innovations of the university, and they were first intended as a remedial aid for students from non-noble backgrounds.

Whatever their original purpose was, they eventually evolved into formal training workshops for intending scholars, with special buildings and libraries devoted to them. Being accepted and enrolling in a seminar was what distinguished the candidate for a degree from the "bread-student" interested only in qualifying for a government job, and seminar members were an elite. At the time of the foundation of the University of Berlin, philology was one of the principal subjects taught in seminar fashion, instructing students in techniques such as text interpretation.[69]

Philology, of course was at the heart of Neuhumanismus, as it was the main method by which the reader could actually enter Greek culture by means of classic literature. It used "historical analysis of language to penetrate the mysteries and incongruities of the remains of the past to reconstruct historical reality."[70] Diehl argues that philology was the first field in which "research" in the modern sense was performed. "The essential paradigms of modern academic scholarship in the humanities developed long before the modern form of academic research in the sciences. These forms and ideals were laid down by the German classical philologists at the end of the eighteenth century. The German philologists not only achieved stunning methodological breakthroughs that advanced their own work, they also created a new sense of their work as constituting an academic discipline, or field. From the beginning this sense of field and of the necessary work of research depended on an immense degree of specialization. From the

beginning it created a barrier between the scholar and the 'outsider'."[71] Humboldt had become close friends with F.A. Wolf, one of the most brilliant of the early philologists, just when these breakthroughs were occurring, and it was then that his fascination with the subject developed. When the University of Berlin started operation, philology was probably the principle subject taught illustrating the union between teaching and research.

However, the situation did not remain static. The "maxim of the intrinsic connection between teaching and research ... had been first enunciated at a time when methodological breakthroughs had revolutionized knowledge and the process of creating knowledge in the humanities. Scholars who had pioneered in these advances were privy to a kind of learning radically different from that claimed by their predecessors. The connection between initiation into this process and participation in it seemed obvious. But what happened when these methodological advances slowed down or ceased? Was the connection between teaching and research so obvious when the increase in knowlege became merely quantitative and no longer qualitative?"[72] The answer appeared to be no. Only a few years after its meteoric rise, philology settled into the rut of "normal science," routinely applying established techniques to mundane problems. As well, the increased knowledge that it had yielded about Greek culture proved to be profoundly disillusioning to many Grecomaniacs -- it was found that the Greeks had not really lived the idyllic existence attributed to them by Humboldt's generation. And so, perhaps not coincidentally, Neuhumanismus expired at around the same time as German Idealism and Naturphilosophie, and research in philology lost much of its allure of

promising the keys to Bildung.[73]

However, it had created the model of an academic discipline, a particular field of knowledge differentiated form the rest by the research questions it asked and the technical skills that had to be learned to answer those questions. To participate meaningfully in the activity of this discipline had at first required little more than the basic command of Greek that the typical student entering university already had accomplished. What Humboldt did not seem to realize was that the first exciting successes scored by the early philologists in solving the field's elementary problems would add to the basic training that subsequent researchers had to master before they could hope to reach the frontier areas of the "utltimately inexhaustible tasks" of this particular district of science and scholarship. Philology very rapidly became a discipline with which only a specialist, a professional researcher, could expect to cope.

However, coincidental with the simultaneous decline of the romantic appeal of philology and of the Naturphilosophie approach to science came the growth of the discipline of chemistry. During the eighteenth century chemistry had been taught in the universities largely as an adjunct to pharmacy in the faculty of medicine. In 1824, Justus Liebig opened a chemistry laboratory for training students at the University of Giessen. It was not the first teaching laboratory, but it rapidly became the best-known. Liebig shrewdly decided to work in the new field of organic chemistry rather than to compete in better-established areas, and he quickly developed a number of analytic techniques and specialized pieces of equipment that allowed rapid and reliable analysis and identification of new compounds. By purchasing a

semi-defunct pharmacy journal he acquired a house-organ for the publication of his research findings, all this resulting in his quickly acquiring a reputation as one of the foremost chemists in Europe.[74]

But as well, as a teaching facility his laboratory became a virtual "knowledge factory". "[T]he use of a set of relatively simple, fast, and reliable experimental methods allowed those students who were less than brilliant to do and to publish competent work. When these techniques were deployed on a large scale a knowledge factory was the likely result. This was characterized by the steady and systematic production of reliable experimental results by ordinary students whose scientific mediocrity had been converted into scientific competence by the acquisition and use of thse very techniques."[75] Add to this a guaranteed access to a medium for publication, and there is little doubt why Liebig's chemistry course was immensely popular with students.

Liebig thus found himself in a position parallel to that of the early philologists. They had just thrown off the shackles of the medieval approach to classical studies; he was recently free of the incubus of Naturphilosophie. Like them he found himself making discoveries through the application of newly developed techniques. Both were presented with the prospect of mysterious and exciting secrets to be discovered: for philology the world of Greek culture, and for chemistry the structure of the physical universe. And for both areas researchers found themselves in the right field at the right time, when the requisite background knowledge for making dramatic progress was minimal. "[C]hemistry had reached that interesting point in its development when only a small stock of theoretical ideas had to

be mastered before embarking on fruitful practical work. The acquisition of technique was more essential, and took longer, than the learning of the necessary basic theory. There was (at least in the beginning) no clear-cut demarcation between teaching and research, none of the years of marching towards the front line that the young soldier of science has to do today. Practical instruction began by repeating the preparation and analysis of well-known compounds; when reliable results were obtained on these, the student went on to less well-known ones, to confirm (or contradict) the few analyses already done; then, by an insensible progression, to the preparation and analysis of new, unknown compounds, work which might well be worth publication."[76]

Liebig's laboratory was what Morrell has drily called "very much an entrepreneurial activity".[77] In addition to supervising thesis work for degree candidates he offered a course in practical chemistry for a fee to virtually all who applied: his colleagues were frequently annoyed at his accepting students without conventional university entry qualifications. Many of his students were apprentice apothecaries who were aware that Liebig was a state examiner for certifying pharmacists. His conventional students could expect to receive their doctorates in less time than average. At a later point he became interested in areas of applied chemistry such as developing chemical fertilizers, which further enhanced his international reputation. "Most of the vast secondary literature on the German influence on the American university is quite general and fails to consider the important financial side of the growth of laboratories and universities in the nineteenth century. It also leaves the impression, in regard to science, that most Americans who studied at German universities sought Ph. D. degrees and

pursued 'pure science'. But the earliest group of American chemists in Germany cared little for degrees and clearly sought to study applied science, which they were eager to use on the practical problems facing the farmers of New York and New England in the 1840's."[78] If Humboldt ever expressed an opinion of Liebig occupying a chair in a faculty of philosophy, it could hardly have been favorable.

And yet, Liebig apparently looked on his work as in the tradition of Wissenschaft, as the following excerpt from his writing would seem to indicate.

> I have found among all who frequent this laboratory for technical purposes a prominent inclination to occupy themselves with applied chemistry. They usually follow hesitatingly and with some suspicion my advice to leave alone all this time-consuming drudgery, and simply to become acquainted with the necessary ways and means of solving purely scientific questions. By following this advice their minds learn easily and quickly how to find the best means; they themselves adapt to circumstances and modify them; all operations, all analyses, which serve to ascertain a certain state, which must be made in order to find the conditions for the solution of the problem, have a definite sense; each of them possesses a certain charm which dispels fatigue, and if the question is really answered, then they know the ways and means of attaining similar ends. I know many who are now at the head of soda-, vitriol-, sugar-factories, of colour-works and other establishments. Without ever having had to do with them beforehand, they were in the first half-hour acquainted with the processes, the second already brought a number of appropriate improvements, etc., etc.[79]

It is doubtful, however, if Humboldt would have approved the use of the phrase "the necessary ways and means of solving purely scientific questions" in this particular context.

Liebig was not alone in using Humboldt's rhetoric as an apologia for educational methods Humboldt had decried for their empirical and utilitarian qualities. The tacit message seemed to be that, although Humboldt was still praised as the father of the university, it was

possible to ignore some of his strictures: to be able to eat your cake and have it, too. "The new scientists adopted the belief that independent research served society not only by adding to the sum of learning but also by contributing to the moral and ethical development of the individual carrying on that research. Like their humanist colleagues before them, they employed that faith not only to justify intensive research activity in itself but also to elevate research to a pedagogical tool, an activity to be demanded even of men destined for strictly practical careers. Such training, DuBois-Reymond argued, offers a benefit 'which accrues even to the mediocre mind, that, at least once in his life before the overwhelming attraction of practical studies seizes him, he has been compelled to one step over the threshold of pure learning and has felt the breath of its spirit; that at least once he has seen the truth sought, found, and cherished for its own sake.'"[80]

Chemistry, like philology before, and like other natural sciences after, became a specialized field requiring more than a few quick practical laboratory courses to became a researcher in; in fact, it soon became impossible for one person to have a mastery of an entire science, and subspecialties proliferated within each field. And the connection with practical applications that Liebig had pioneered mushroomed as well, with a large proportion of the research scientists trained in German universities going straight into Germany's burgeoning industrial complex. But as recently as 1967 a German academic could comment: "At ... academic convocations, it is customary to invoke Humboldt's name at our universities. To be able to call on him is to legitimize oneself, and that is not only important for conservatives.

Whoever, as well, intends to engage in reform makes his work with us easier by the proof that he really only hopes to bring about what Humboldt actually wanted."[81] It could still be said today.

I will conclude this section by describing an intriguing vignette of history that awakens uncanny echoes today. During the eighteenth century the German states, although they had the right to appoint professors to vacancies, generally lacked the capability to evaluate candidates, and so tended to defer to the advice of the other professors in the relevant faculty of the university involved. During this period academic publications were not given much consideration, or if they were, tended to be of a broad nature addressed to the educated public, or text books, as the faculty being polled would not be familiar with the literature of the vacant position. As the reform movement gathered momentum during the nineteenth century, however, with education ministries increasing in size and efficiency, governments began to require candidates to submit their publications for review and to obtain specialist advice from universities further afield, as they were anxious to acquire faculty with a more than local reputation. Under these circumstances candidates with impressive specialized publication records began to gain a competitive edge. The "publish or perish" syndrome arrived early on the German university scene.[82]

THE AMERICAN CONNECTION

Ideally, in this section I should discuss the influences of the German university on American higher education. However, considering the amount of material written on this subject (and also what has not

been written, but should have been), the length of this paper could be at least doubled and still not do the subject justice. So I will have to be brief and selective.

First, what did American students in Germany experience? Summarizing the first part of this paper, reforms to the education system at the start of the eighteenth century were made during a period of flux. Some of the proposed features of the new university were abandoned, and different educational functions substituted. The version of the institution that finally prevailed was successful in training professionals and scientists for an urbanizing and industrializing society. It was less successful at providing a general or liberal education, as it had originally intended. However, as the rhetoric of that originally proposed general education had become enmeshed in the cultural and national mystique of the German people, there was reluctance to abandon it. The German university eventually demonstrated a marked discrepancy between its rhetoric and its practice.

For Americans contemplating using the German university as a model, apart from the discrepancy between practice and rhetoric there were a number of concrete differences between the German and American scenes that tended to be overlooked. Among these were:

1. The level of preparation of students entering university. Some German freshmen were the equivalent of some American college graduates.
2. The value put on a university degree. It had limited usefulness in Germany, relative to the professional qualifications governed by state examinations. The American

university degree tended to substitute for many of these German state qualifications.

3. The obstacles confronting the minority of German students wishing to be awarded a degree, such as choosing a subject and obtaining the sponsorship of a full professor.
4. The uncertain career prospects of students wishing to become professors.

That these differences were overlooked by American visitors to Germany has been noted by several writers. Among the suggested reasons for this were that foreign students tended to receive preferential treatment relative to German ones, American students tended to concentrate on more familiar subjects such as the natural sciences or foreign languages and to avoid the more "German" subjects such as philosophy or philology, and American students tended to mix largely with each other, having little contact with their German classmates.

What did the Americans transplant of the German university? Considering the difficulties and the misunderstandings, the results were surprisingly good. The American university became a composite of a graduate school, based roughly on the German model, superimposed upon an undergraduate institution patterned after an Oxbridge college, solving most of the problems. The undergraduate college offered an elementary and relatively structured curriculum, suitable for entering students of varying interests, abilities, and levels of preparation, and roughly approximating the function of the Gymnasium, the German secondary school. Most students were awarded a bachelor's degree that was recognized as a qualification for a number of jobs and occupations. The minority of students who were more serious about academic work

could advance to the graduate school, where study was based on free research. The system could also provide a career that accommodated faculty with a variety of abilities, experience, and qualifications, ranging from younger assistant professors teaching largely undergraduate courses to senior full professors who only supervised graduate students. This assured reasonable access to the career, security of appointment, and prospects of advancement.

One problem that was not solved by this compromise -- if anything, it was exacerbated — was the dual role of professor as teacher/researcher. The German professor (rhetoric of Bildung aside) functioned largely as a researcher dealing with mature students; the English don (before World War I) was a tutor ministering to the character development of young people. They experienced little conflict in their role expectations. But the American professor was expected to do both, simultaneously.

It is puzzling that not only should such a painful problem remain unresolved for as long as it has, but that so many of the proposed solutions should be resisted as strongly as they are. One possible explanation is in the elevation in status that the dual function provides. The Oxbridge dons had been few in number and were members of an elite institution that was easily distinguishable from a secondary school. Neither the German professor nor the American college instructor had enjoyed that sure distinction in the eighteenth century, however; both had fulfilled functions often virtually identical with school teachers, working in a large number of essentially local institutions, and had enjoyed little status difference. The professor in the reformed German university, however, had been elevated greatly

in status above the school ~~leader~~ teacher, in part because the one carried out an educational function that carried the mystique of Wissenschaft while the other was a mere pedagogue. In addition the researcher was perceived as benefitting mankind in general through contributions of knowledge to science and industry. Given the contrast the American students in Germany must have found between the heroic figure the professor posed there and the little-respected college instructors they remembered from home, it would seem plausible that the benefits of the dual role would have outweighed the conflicts.

NOTES

1. Veysey (1973), 406.
2. McClelland (1980), 28.
3. Paulsen (1906), 16, 26-27, 36-37.
4. Ringer (1969), 5-8.
5. McClelland (1980), 32-33, 42-57, 94.
6. McClelland (1980), 29, 33.
7. Ringer (1969), 5-21.
8. Anchor (1972), 10.
9. McClelland (1980), 26-33; Paulsen (1906), 42-44; Turner (1974), 495-503.
10. McClelland (1980), 34-35; Paulsen (1906), 44-47; Turner (1974), 504-504.
11. McClelland (1980), 35-46; Paulsen (1906), 47; Turner (1974), 504-505.
12. Paulsen (1906), 44-47.
13. Paulsen (1906), 47.
14. McClelland (1980), 56.
15. Brunschwig (1974), 227.
16. Brunschwig (1974), 183-184.
17. Taylor (1970), xi.
18. Anchor (1972), 407.
19. Halsted (1969), 2-3.
20. Halsted (1969), 10-11.
21. Halsted (1969), 12.
22. Halsted (1969), 13.
23. Brunschwig (1974), 229.
24. Brunschwig (1974), 183.
25. Barzun (1961), 94.
26. Halsted (1969), 37-38.
27. Brunschwig (1974), 230.
29. Taylor (1970), 106-107.
30. Knight (1976), 163-165.
31. Knight (1976).
32. Hufbauer (1971), 229-231.
33. Lilge (1948), 58.
34. Paulsen (1906), 47.
35. Quoted by Scott (1960), 4-5.
36. Humboldt (1807-08). Quoted by Cowan (1963), 79-80.
37. Diehl (1978), 21.
38. Fallon (1980), 5-6; Lilge (1948), 4-5.
39. Sweet (1978), 69.
40. Quoted in Fallon (1980), 25-26.
41. Scott (1960), 10.
42. Fallon (1980), 11-12; Sweet (1978), 3-14, 69-70.
43. Fallon (1980), 11.
44. Scott (1960), 12.
45. Humboldt (1970), 242-243.
46. Humboldt (1970), 243.
47. Humboldt (1970), 243-244.
48. Sweet (1978), 68-69.
49. Humboldt (1970), 248.

50. Humboldt (1970), 244-245.
51. Humboldt (1970), 245.
52. Scott (1960), 13.
53. Humboldt (1970), 245; Scott (1960), 15-16. Scott says that additional information concerning Humboldt's memorandum is to be found "in the numerous minutes made in his department (p. 12)", to which he presumably refers but does not cite.
54. Humboldt (1970), 245-246.
55. Humboldt (1970), 245.
56. Fallon (1980), 32-33.
57. Ben-David (1968), 7-8.
58. Busch (1963); Fallon (1980), 32-36.
59. Humboldt (1970), 247.
60. Scott (1960), 13-14.
61. McClelland (1980), 172-173.
62. Good (1936), 561-562. Quoted in Morrell (1972), 37-38.
63. Fallon (1980), 10-14.
64. Paulsen (1906), 278-281.
65. Fallon (1980), 39-41; Rivger (1969), 34.
66. Holbom (1964), 481.
67. Paulsen (1906), 58.
68. Paulsen (1906), 212.
69. McClelland (1980), 177-181; Paulsen (1906), 64-65, 212-213, 312; Turner (1971), 145-146.
70. Diehl (1978), 27.
71. Diehl (1978), 146-147.
72. Diehl (1978), 150.
73. Diehl (1978), 9-10, 15-27, 40-47, 140, 145-148, 150.
74. Hufbauer (1971); Morrell (1972).
75. Morrell (1972), 5.
76. Farrar (1976), 185.
77. Morrell (1972), 3.
78. Rossiter (1975), xiii.
79. Quoted in Merz (1965), 174-175.
80. Turner (1971), 152-153.
81. Lubbe (1967); quoted in Fallon (1980), 10.
82. Turner (1971), 170-172.

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